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| APPLICATION NO.                     | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-------------------------------------|-------------|----------------------|---------------------|------------------|
| 10/661,728                          | 09/12/2003  | Wu Li                | SMBZ 2 01007        | 8276             |
| 27885                               | 7590        | 02/05/2008           | EXAMINER            |                  |
| FAY SHARPE LLP                      |             |                      | THOMPSON, CAMIE S   |                  |
| 1100 SUPERIOR AVENUE, SEVENTH FLOOR |             |                      | ART UNIT            | PAPER NUMBER     |
| CLEVELAND, OH 44114                 |             |                      | 1794                |                  |
| MAIL DATE                           |             | DELIVERY MODE        |                     |                  |
| 02/05/2008                          |             | PAPER                |                     |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/661,728             | LI ET AL.           |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Camie S. Thompson      | 1794                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on Amendment filed May 16, 2007.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1 and 3-45 is/are pending in the application.
- 4a) Of the above claim(s) 29-44 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1 and 3-28 and 45 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date. _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

1. Applicant's amendment and accompanying remarks filed May 16, 2007 are acknowledged.

### *Claim Objections*

2. Claim 3 is objected to because of the following informalities: Claim 3 is dependent upon claim 2, which has been cancelled. Examiner is interpreting claim 3 as being depended on claim 1. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 3-28 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takehashi et al., U.S. Patent Number 5,142,192 in view of Yano et al., U.S. Patent Number 6,699,596.

Takehasi discloses an electroluminescent element that includes insulating layers on both sides of a luminous layer wherein the luminous layer comprises ZnS:Mn (see column 3, lines 62-63) and the insulating layer comprises a fluoride-containing material such as MgF<sub>2</sub> (see column 3, lines 51-68). Additionally, embodiment 4 of the Takahashi reference discloses that the luminous layer can comprise SrS:Ce. Takahashi does not disclose that the phosphor layer is a rare earth metal activated barium thioaluminate or rare earth activated magnesium barium thioaluminate. Yano

discloses a blue full color EL display comprising a phosphor thin film wherein the phosphor is a barium thioaluminate or magnesium barium thioaluminate with europium added as the activator (see column 2, lines 46-68). Column 3, lines 1-16 discloses that the atomic ratio of Mg to Ba may fall in the range between 0.05 and 0.8,  $x = 1-5$ ,  $y = 1$  to 15  $z = 3-30$  and  $w = 3-30$ . Also, the reference discloses that the phosphor thin layer is sandwiched between first and second insulating layers (see Figure 2 and column 6, lines 42-53). Column 2, lines 64-68 of the Yano reference discloses that oxygen may substitute for sulfur in barium thioaluminate to yield an oxysulfide. Also, example 1 of the Yano reference discloses that the magnesium barium thioaluminate film contains a substantial amount of oxygen. It is disclosed in column 6, lines 53-68 of the Yano reference that the substrate can be a glass or glass ceramic substrate. Yano also discloses that the phosphor thin film is annealed at 400 to 800 °C. Additionally, Yano discloses that the light emitting layer comprising the phosphor thin film of magnesium barium thioaluminate is preferably about 100 to 2,000 nm thick (see column 4, lines 58-64). Column 7, lines 11-43 of the Yano reference discloses that the first thick film insulating layer has a thickness of 5-50  $\mu\text{m}$  and the second insulating layer has a thickness of 100 to 500 nm. Figure 2 of the Yano reference discloses a dielectric layer. Yano discloses in column 1 that blue luminescence can be achieved by SrS:Ce (same phosphor used in Takehashi reference). However, Yano does discloses that the luminescence of SrS:Ce is short and that blue luminescence can be improved using thioaluminate phosphors such as BaAl<sub>2</sub>S<sub>4</sub>:Eu (see column 1, lines 40-60). Therefore, it would have been obvious to one of ordinary skill in the art to use a thioaluminate phosphor such as BaAl<sub>2</sub>S<sub>4</sub>:Eu in an electroluminescent element in order to have blue light with higher purity and a display of better quality.

***Response to Arguments***

6. Applicant's arguments filed May 16, 2007 have been fully considered but they are not persuasive. Applicant argues the combination of Takehashi in view of yano. Applicant argues that any combination of Yano and Takehasi fails to render the present claims unpatentable. Takehasi discloses insulating layers on both sides of a luminous layer wherein one of the insulating can comprises magnesium fluoride as required by the present claims. Also, Takehashi discloses that the luminous layer can be a blue emitting phosphor such as strontium sulfate with cerium as an activator. Although Takehashi does not disclose a rare earth metal activated barium thioluminate or rare earth activated magnesium barium thioaluminate. Yano discloses barium thioaluminate or magnesium barium thioaluminate with an activator such as europium used in a phosphor thin film with first and second insulating layers. It would have been *prima facie* obvious to substitute a known phosphor for another known phosphor ( SrS:Ce (blue) with barium thioaluminate (blue). Absent a showing of superior/unexpected results provided by a barium thioaluminate luminous layer versus a strontium sulfide luminous layer when both phosphors are blue emitting phosphors and are known to be useful for the same purpose. The rejection is maintained.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (571) 272-1530. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris, can be reached at (571) 272-1478. The fax phone number for the Group is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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